NEW BOOKS.

A Text-book of General Physics, Electricity, Electromagnetic Waves, and Sound. By J. A. CULLER. Philadelphia: J. B. Lippincott Company. Pp. x + 311. $1.80.

This volume supplements the author's "Mechanics and Heat" already published and completes his "General Physics." The noteworthy features of the present volume are (1) the treatment of electricity and magnetism from the standpoint of the electron theory and (2) the logical development of the subject of light on the basis of the discussion of electricity. The former feature allows the author to begin his book with a very old topic, "What Electricity Is" and to follow this with some remarks on the electron theory which should be of real help to the student in forming a clear physical conception of many electrical phenomena. A similar paragraph in the second chapter, "What Magnetism Is," gives modern ideas on that subject.

While the author has shown courage in bringing back into the first pages of a modern text-book these two questions for discussion, the second feature above pointed out is a new departure that is of especial interest. Fifteen years ago the reviewer had a vision of a text-book in "General Physics" which should not be divided into mechanics, sound, heat, light, and electricity but which should be really a *general* text-book. Under force would be considered, not merely forces due to stretched strings and gravitation, but also forces due to electric fields, magnetic fields, etc.; under waves would be treated not only waves in strings but also waves in water, air, and ether. Dr. Culler has made a step in this direction. He has very well introduced the subject of light under the head of electromagnetic waves and the reviewer believes the reader of this text will have a much clearer conception of both optical and electrical phenomena as a result of this method of treatment.

Sound is disposed of in 23 pages, of which more than 4 are devoted to musical scales.

The treatment throughout is usually clear and logical, but derivations such as that of the potential due to a charged point (p. 12) are much more elegant when a little simple calculus is used. Some statements (on p. 122) with regard to the Ayrton universal shunt are misleading. The equation (94, p. 121) shows clearly that the total current, i_m, must be independent of the shunt position if the galvanometer currents are to be in the ratios 1/10, 1/100, etc. The loose statements here referred to are frequent in discussions of the Ayrton shunt.

The publishers have done a great favor to students by using a dull finished paper in the manufacture of this book. This avoids glare, which

is especially annoying in many text-books, as they are very often read by artificial light.

R. A. P.

Solid Geometry. By Sophia Foster Richardson. Boston: Ginn and Company. Pp. 209. 90 cents.

Miss Richardson has written a scholarly book with some interesting features. She is evidently opposed to the tendency in some quarters to minimize the subject of solid geometry, for this book is a maximum as compared with the usual course now given in schools and colleges. It reflects a teacher who thoroughly enjoys the subject.

The incommensurable case is given unusual attention in that twenty pages of the appendix are devoted to the theory of irrational numbers and the theory of limits. This extreme treatment may well prove unfitted for the average college freshman. The book is said, however, to be just as well adapted for the entire omission of the incommensurable case. The volume of the rectangular parallelepiped is proved without using any of the theorems on the ratio between such parallelepipeds; the three dimensions being assumed commensurable with the unit in the commensurable case.

The book is explicit in stating some of the axioms of continuity and betweenness that are usually taken implicitly.

Most of the theorems are proved in full, and when proofs are omitted the reason sometimes seems to be the relative unimportance of the proposition rather than its fitness for original proof by the pupil.

On the whole the book does not seem adapted to secondary school pupils, but it will prove worth examining for those who wish a full course for college freshmen.

Vocational Arithmetic. By H. D. Vincent. Boston: Houghton Mifflin Company. Pp. 126. 55 cents.

This book is composed of one hundred lessons on one hundred business problems, including such diverse topics as express, road building, wagon making, school financing, poultry raising, living expenses, street cars, milk industry, and cotton raising.

Each lesson contains questions of general interest regarding the industry, a list of its words to be spelled, and some requirements in writing business forms, besides the problem itself.

The problems all give practise in the use of the fundamental operations with simple numbers as they are used in the less complex operations of daily life. They might be criticised, however, in that they nearly all reduce to a credit and debit accounting of a transaction, and therefore are too much a repetition of the same methods and operations.

The book was originally written for night schools, and it seems to have a place in their work. While it is doubtful whether it would serve as an elementary school text, it has much that will repay examination by teachers in such schools.